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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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09/328,645

06/09/1999

HENRY CHUNG

30-4718(4780

7088

7590

08/10/2004

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EXAMINER

VU, HUNG K

ART UNIT

PAPER NUMBER

2811

DATE MAILED: 08/10/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

## Office Action Summary

Application No.

09/328,645

Applicant(s)

CHUNG, HENRY

Examiner

Hung K. Vu

Art Unit

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 28 May 2004.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-16 is/are pending in the application.
- 4a) Of the above claim(s) 1-4 and 8-16 is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 5-7 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- ☐ Notice of References Cited (PTO-892)
- ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date \_\_\_\_\_.
- ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_.
- ☐ Notice of Informal Patent Application (PTO-152)
- ☐ Other: \_\_\_\_\_.

## DETAILED ACTION

### *Request for Continued Examination*

1 A request for continued examination (RCE) under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 05/28/04 has been entered. An action on the RCE follows.

### *Claim Rejections - 35 USC § 102*

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

Claims 5-7 are rejected under 35 U.S.C. 102(e) as being anticipated by Lu et al. (PN 6,008,540, of record).

Lu et al. discloses, as shown in Figure 1g, an integrated circuit structure which comprises

a substrate (102);

a layer of a first polymeric dielectric material (144 of HSQ) directly on the substrate [Col. 5, lines 1-3];

Lu et al. teaches, at Col. 5, lines 16-49, more levels will be formed by repeating steps (4)-(15). As the result a plurality of spaced apart metal contacts (160, equivalent to 130) being formed on the layer of the first dielectric material (144 of HSQ);

a space between adjacent metal contacts, each space being filled with a second polymeric dielectric material (172 of xerogel, equivalent to 142) [Col. 5, line 3];

a recess in the filled spaces of the layer of the second polymeric dielectric material extending from a level at a top of the metal contacts a part of the distance toward the substrate;

an additional layer of the first polymeric dielectric material (174 of HSQ, equivalent to 144) directly on at least some of the metal contacts and in the recesses directly on the filled spaces of the second polymeric dielectric material such that there is optionally a gap in at least one of the recesses of the additional layer first polymeric dielectric material at a side wall of a metal contact [note that the examiner interprets the word “optionally a gap ... “ as “no gap” at all] ;

Lu et al. teaches, at Col. 5, lines 16-49, more levels will be formed by repetition of steps (4)-(15), therefore, it is inherent that there is at least one via extending through the additional layer (174) of the first polymeric dielectric material extending to the top of at least one of the metal contacts (160) and optionally to the gap [note that the Examiner interpret the word “optionally“ as “no or none”];

since the first dielectric material and the second dielectric material have different material, it is inherent that they have substantially different etch resistance properties.

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In a different embodiment, Figure 2b, Lu et al. teaches forming the layer of first polymeric (242 of xerogel) on the substrate (102) [Col. 5, lines 30-33], a plurality of metal contacts (260) on the layer of first polymeric (242), the layer of second polymeric (244 of HSQ) filled the space between adjacent metal contact [Col. 5, lines 25-33], a recess in the filled space, and the additional layer of first polymeric (272 of xerogel) formed on the metal contacts (260) and in the recesses [Col. 5, line 45]. Or also in Figure 2b, Lu et al. teaches forming the layer of first polymeric (244 of HSQ) on the substrate (102) [Col. 5, lines 25-33], a plurality of metal contacts (260) on the layer of first polymeric (244), the layer of second polymeric (272 of xerogel) filled the space between adjacent metal contact [Col. 5, line 45], a recess in the filled space, and the additional layer of first polymeric (274 of HSQ) formed on the metal contacts (260) and in the recesses [Col. 5, lines 45-46].

With regard to claim 6, Lu et al. discloses, at Col. 5, lines 16-49, more levels will be formed by repetition of steps (4)-(15), therefore, it is inherent that there is at least one via extending through the additional layer (174), wherein the via is filled with at least one metal [Col. 3, lines 23-47].

With regard to claim 7, Lu et al. discloses the first dielectric material (242, 272) is organic [xerogel, Col. 5, line 31 and Col. 5, line 45] and the second dielectric material (244) is inorganic [HSQ, Col. 5, lines 25-33].

***Response to Arguments***

3. Applicant's arguments filed 05/28/04 have been fully considered but they are not persuasive.

It is argued that Lu et al. does not disclose a layer of a first polymeric material directly on the substrate. This argument is not convincing because Lu et al. discloses, as shown in Figure 1g, a layer of a first polymeric material (144) directly on the substrate (102). Note that the phrase “directly on” does not necessarily mean “directly in contact with”.

It is argued that Lu et al. does not disclose the formation of an additional layer of the first polymeric dielectric material on the metal contacts and in the recesses nor specify the material of the layer of the first polymeric dielectric material and the additional layer of the first polymeric dielectric material must be the same. This argument is not persuasive for the following reasons: First, Appellant relies on different elements than the ones used by the examiner. For example the examiner relied on elements 144, 160, 172 and 174 of Figure 1g, elements 242, 260, 244 and 272 of Figure 2b, or elements 244, 260, 272 and 274 also of Figure 2b, but Appellant argues about elements 120, 140, 130, 142, 144 and 146 of Figure 1g, or elements 246, 260, 270, 272, 274 and 276 of Figure 2b. Lu et al., in Figure 1f and Col. 5, lines 15-21, teaches that further levels result from repetition of steps (4) – (15). So, as shown in Figure 1g, the additional layer of first polymeric (174 of HSQ) formed on the metal contacts (160) and in the recesses. The layer of first polymeric (144 of HSQ) and the additional layer of first polymeric (174 of HSQ) are formed of the same material.

Further, in a different embodiment, Figure 2b, Lu et al. teaches the additional layer of first polymeric (272 of xerogel) formed on the metal contacts (260) and in the recesses. The layer of first polymeric (242 of xerogel) and the additional layer of first polymeric (272 of xerogel) are formed of the same material. Or also in Figure 2b, Lu et al. teaches the additional layer of first polymeric (274 of HSQ) formed on the metal contacts (260) and in the recesses. The layer of first polymeric (244 of HSQ) and the additional layer of first polymeric (274 of HSQ) are formed of the same material.

It is argued that Lu et al. does not disclose the first and second dielectric materials have substantially different etch resistant properties. This argument is not persuasive because Lu et al. teaches the first and second dielectric materials are different (xerogel or HSQ), therefore, it is inherent that the first and second dielectric materials have substantially different etch resistant properties.

It is argued that that Lu et al. does not disclose the second dielectric material which is in contact with the metal contacts and with the first dielectric material. This argument is not convincing because the features upon which Appellant relies (i.e., in contact with the metal contacts and with the first dielectric material) are not recited in the rejected claim(s).

### ***Conclusion***

3. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Hung K. Vu whose telephone number is (571) 272-1666. The

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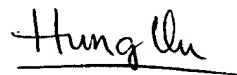
examiner can normally be reached on Mon-Thurs 6:00-3:30, alternate Friday 7:00-3:30, Eastern Time.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Eddie C. Lee can be reached on (571) 272-1732. The Central Fax Number for the organization where this application or proceeding is assigned is (703) 872-9306.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0956.

Vu

August 3, 2004

A handwritten signature in cursive script, appearing to read "Hung Vu", written over a horizontal line.

Hung Vu

Patent Examiner